

ABSTRACT

The present invention relates to methods employing fiberoptic evanescent wave Fourier transform infrared (FEW-FTIR) spectroscopy using fiberoptic sensors operated in the attenuated total reflection (ATR) regime in the middle infrared (MIR) region of the spectrum (850 to 4000 cm^{-1}). The apparatus and method claimed is applied to diagnostics and characterization of noninvasive and rapid (seconds) direct measurements of spectra (in real time) of normal and pathological tissues in vivo, ex vivo and in vitro. The aim of our invention is testing and monitoring of normal skin and various skin tumor tissues at the early stages of their development. Furthermore the apparatus and method is suitable for fluid diagnostics, as well as endoscopic and biopsy applications. Specifically the remote diagnostics of normal skin and malignant tissue on the skin surface (directly on patient) can distinguish between normal and malignant skin. In addition the apparatus and method can be applied for different types of clinical diagnostics. Finally the invention relates to diagnostics of environmental damage of skin tissue and acupuncture points, and treatment of skin tissue on a molecular level.